TELEVISION & RADIO

Your Guide To Better Reception

INTERFERENCE

COMMERCE
MINISTRY OF COMMERCE
Te Manatū Tauhokohoko

Radio Frequency Service

TELEVISION AND RADIO INTERFERENCE

Your Guide to Better Reception

Issued by:

The New Zealand Radio Frequency Service
Communications Division
Ministry of Commerce
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NOTE: The nature of radio spectrum management is such that information contained in this document is subject to changes without notice. The Crown does not accept any liability for damage or loss arising from reliance on any information contained in this document.

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INTRODUCTION

Most New Zealand households now enjoy good television and radio reception. However, many people needlessly put up with reception problems, which often can be resolved from their home either by themselves or with the aid of a service technician.

A large proportion of reception problems where interference is suspected are caused by deficiencies in receivers, inadequate or faulty aerial installations, or trying to receive broadcast transmissions which are too distant for reliable reception.

Other reception problems may be due to electrical interference from any of a wide variety of sources, either within or beyond the household affected.

The New Zealand Radio Frequency Service, which is the Operations Group of the Communications Division of the Ministry of Commerce, will investigate complaints of interference to radio and television reception within the coverage area of the television or radio station affected.

Before reporting your reception problem to the New Zealand Radio Frequency Service, you should carry out some home checks which may well show that the problem can be readily resolved. What follows is an illustrated guide on what you may do to diagnose the likely cause of the problem and determine what action should then be taken.

WARNING: Television receivers, and to an extent radio receivers, can contain circuitry producing dangerous voltages which may persist after the receiver is turned off. Under no circumstances should you try to carry out a check or modification of internal components. This work should only be done by a qualified service technician.

AERIALS

Aerials designed for outdoor use and which are properly positioned outside of the house usually help television and radio receivers to resist interference by increasing the wanted signal. Generally, indoor aerials do not work as effectively as outdoor aerials, and are more likely to pick up electrical interference.

Indoor aerials may be satisfactory in strong signal areas, but when an interference problem occurs it is usually necessary to install an outdoor aerial.

TELEVISION

The following check list assumes the use of an outdoor aerial

WHAT YOU CAN DO

Check that you have the correct type of outdoor aerial

Each aerial is designed to receive a particular group of television channels. If you brought your aerial with you from another area, or a new television channel has begun broadcasting in your district, or any of your existing channels have changed to the UHF band, then you may need to change your aerial.

Aerials are designed for a particular signal level. If you live near the outer edge of the coverage area of your local television station, you will require a higher performance aerial than people living close to the station.

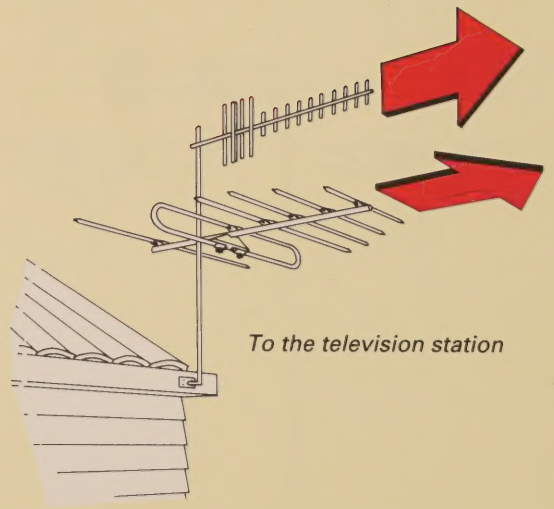
Check that your aerial is pointing in the right direction

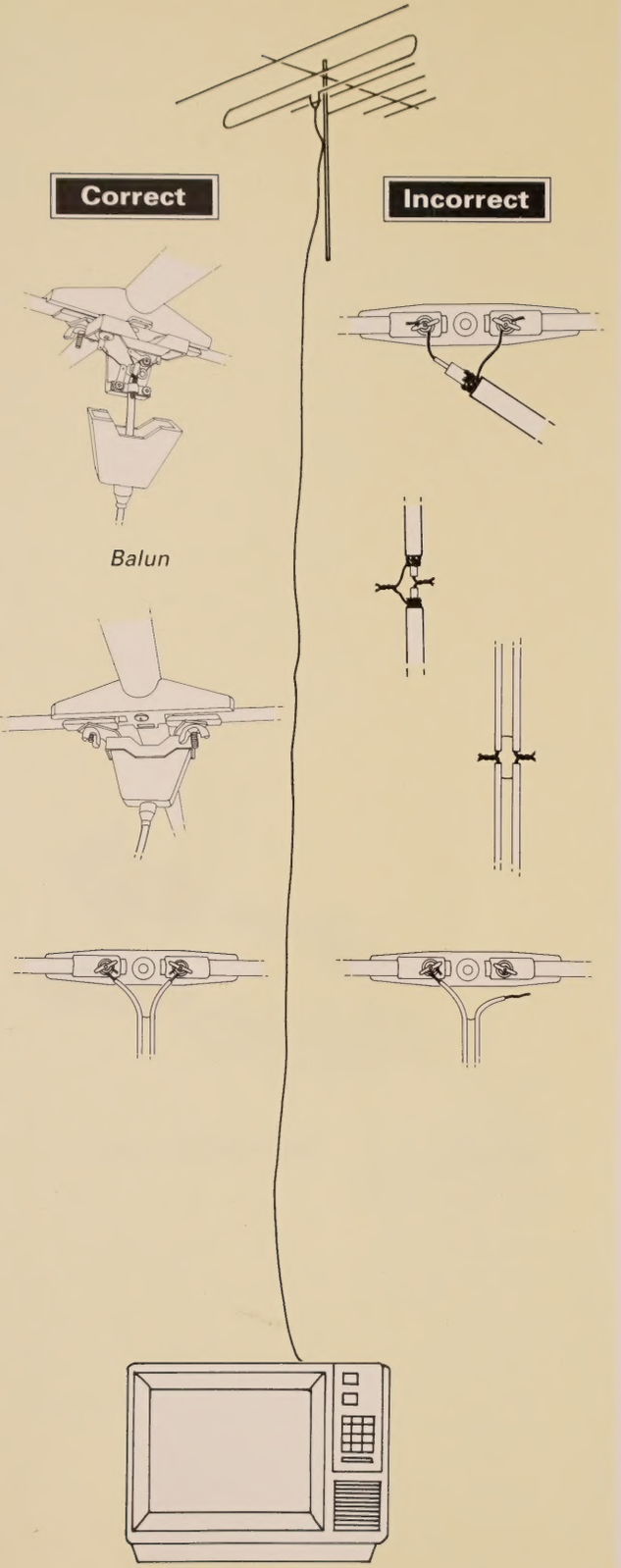
Outdoor aerials usually have a number of elements and the end with the shorter elements should point towards the television station.

Check that your aerial is mounted the right way (horizontally or vertically)

Your aerial must be installed with its elements horizontal or vertical, to match the television signals that you wish to receive.

Note: Neighbouring aerials can be used as a guide to installing your aerial in the right way and direction.





Check the condition of your aerial

Aerials deteriorate over time. Check that your aerial has all its elements and that they are tightly attached. Also check that it is not corroded, particularly where the aerial lead is connected, and ensure that this area is cleaned of deposits such as salt spray or soot.

Check that you have the right type of aerial lead

The two common types of aerial lead are the round, coaxial cable, and the flat ribbon or twin-wire lead.

A good quality, coaxial cable is recommended to receive television signals. Coaxial cable requires less care in installation than the ribbon type, is less prone to some types of interference, and has more resistance to the weather.

The common ribbon types are not suitable for UHF television signals, but are usually satisfactory for VHF channels (1 to 11).

Check the condition of your aerial lead

If any part of the aerial lead is broken, the lead itself can pick up interference.

Replace the aerial lead if there are any cracks in its plastic covering, either due to weathering or because it has been joined. Any break allows moisture to corrode the wire and reduce the television signal.

Coaxial cable leads are usually connected to the aerial through a unit called a 'balun', which is enclosed in a plastic weatherproof container attached to the aerial. Check that the plastic cover is not cracked, as once moisture gets in, the television signal may be seriously reduced.

Check the aerial lead connections

The cure for many reception problems is simply to repair the aerial lead connections at either end of the cable or ribbon, because these are the most likely places for breaks and corrosion to occur. The braid of a coaxial cable will often pull away from the plug at the television receiver end or it may touch the centre wire within the plug and short-out the television signals.

Check that you have used the right aerial lead connections

It is important that the right aerial lead connections have been used throughout your television installation. There are two common types of aerial lead and each requires its own special connections, both at the aerial and at the television receiver.

UHF / VHF

Where your television receiver provides a choice of connections for the aerial lead, check the instruction booklet for the receiver to ensure that the right ones have been used.

Check that your aerial is correctly positioned

Your aerial may not be in the best position for good reception due to the blocking of the television signal by buildings or other structures. You may need to re-position your aerial to avoid the effects of such obstructions and improve the quality of the received signal.

Check that your aerial distribution system is operating correctly (if you have a more complex aerial system)

If your home has a more complex aerial system (with multiple outlets) or you live in a block of flats, a unit, a hotel, or motel, consult an aerial specialist if there is any reason to suspect that the television distribution system might be faulty.

RADIO

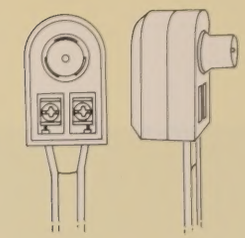
Check your aerial system

Most of the checks listed under Television in this section can also be applied to FM radio receivers. Portable FM radio receivers are usually fitted with a telescopic whip aerial, the length and/or position of which can be adjusted for improved reception. Best reception is likely to be obtained when an outdoor aerial is used.

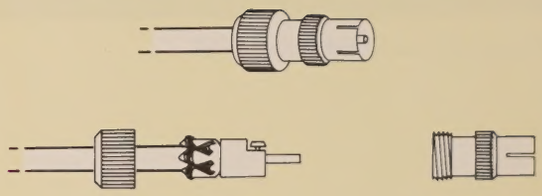
AM radio receivers are usually fitted with a built-in directional aerial. Some have a socket for an outdoor aerial such as a long wire or large vertical whip for improved reception. If no socket is available, a service technician should be able to modify your receiver for connection to an outdoor aerial. A good earth may also be helpful in improving reception.

Common aerial lead connectors

Balun



Co-axial plug



Normal picture (interference free).

RECEIVERS

TELEVISION

(includes video cassette recorders)

The information in this section applies also to video cassette recorders (VCRs), because they are essentially television receivers without picture tubes. They may suffer the same reception problems as television receivers alone.

Many faults or deficiencies in the television receiver, the VCR, the aerial lead, or the aerial itself, can produce effects which appear to be television interference. Portable television receivers fitted with an in-built aerial or a set-top aerial are more prone to reception problems, and where these are experienced the receiver should be connected to an outdoor aerial (see section on **Aerials**).

The following check list applies only to television receivers connected to a correct and properly positioned outdoor aerial

WHAT YOU CAN DO

Disconnect your VCR (if you have one)

Some VCRs are more easily affected by interference than are television receivers alone.

Unplug your VCR from the power mains and shift the aerial lead from the 'RF IN' socket of the VCR to the television receiver aerial socket.

If this cures the reception problem, it indicates a fault or deficiency in your VCR. If so, you should first check the settings of the VCR controls and switches with the aid of the VCR handbook. If this does not solve the problem you should consult a service technician.

Some VCRs are easily affected by strong signals from nearby radio transmitters. Advice on identifying and curing various types of interference caused by radio transmitters appears in the section on **Radio Transmitter Interference** and applies to both television receivers and VCRs.

Check controls not often used

Use the appropriate section of your television receiver handbook to check the adjustment of controls and the settings of switches. Some controls and switches that are rarely used can cause interference-like effects if accidentally moved from their correct position.

Try another television receiver (if there is one available)

- Turn off the original receiver, as it may affect the results of this test.
- Connect your outside aerial to the second receiver.
- The original receiver is likely to be faulty, if the second receiver does not have the same reception problem. In this case have a service technician check the original receiver.
- If both receivers are similarly affected the problem is likely to be external to them.

Ask your neighbours if they have the same problem

Many television receiver faults can appear to be interference, particularly if the trouble comes and goes for no apparent reason. A simple test is to check with your neighbours. If they don't have the problem, then it is unlikely to be interference.

But, if they say they do have reception difficulties, be sure they get exactly the same problem, at the same time, and on the same channel, or their answer may be misleading. Preferably, view the problem yourself on their television receiver.

RADIO

A large proportion of radio reception difficulties are found to be faults or deficiencies in the listener's radio receiver.

WHAT YOU CAN DO

Try another receiver

The original receiver is likely to be be faulty if the second receiver does not have the same reception problem, but there may be a difference between battery and mains powered radio receivers. For this test the second receiver should be of the same type i.e. battery or mains powered, and connected in the same way, as the original receiver.

Check the batteries in portable receivers

Try a new set of batteries if there is any doubt about their condition.

Check that the receiver is getting sufficient signal

The internal aerial used in a portable AM radio receiver is directional, so try turning the receiver to obtain the clearest reception of the broadcast station affected. For large cabinet models and the tuners of hi-fi systems, the aerial may be able to be adjusted without moving the position of the receiver.

For a portable FM radio receiver, try adjusting the length and/or position of the telescopic aerial for improved reception. If the receiver has a connection for an outdoor aerial, this should be used (see section on **Aerials**).

WEAK SIGNALS

It is usually impossible to cure interference to the reception of distant broadcast stations that are not intended for your location

Each television and radio broadcast station is designed to service a particular geographic region, called its coverage area, within which there should be sufficient signal strength to override the background level of interference that is usually present.

While signals from distant broadcast stations may be able to be improved to a satisfactory level by the use of special aerials and/or amplifiers, continued reception of any station from outside its coverage area cannot be guaranteed.

TELEVISION

Where the signal level is being reduced by an obstruction, it may be possible to find a new location for the aerial on your property where the signals are not blocked.

Often, a higher performance aerial will help overcome problems caused by low signal strengths. Sometimes, a mast-head amplifier may be necessary, although such an amplifier may increase the level of local interference as well as the desired signal.

WHAT YOU CAN DO

Check your aerial system as outlined in the Aerials section

If there is no improvement, contact a service technician or aerial specialist for further assistance.

RADIO

AM radio reception of weak and/or distant stations at night is prone to fading and distortion, caused by the simultaneous reception of both wanted and unwanted stations.

WHAT YOU CAN DO

Check your aerial system as outlined in the Aerials section

If there is no improvement, contact a service technician or aerial specialist for further assistance.

This is the type of picture you will see if your receiver is not getting enough signal.

Normal picture.

GHOSTING

(MULTIPATH RECEPTION)

Examples of ghosting.

The multiple images seen in these pictures are produced when part of the signal comes directly from the transmitter, while another part has been reflected from a hill, a building or some other large object in the locality.

The reflected signal travels a greater distance than the direct signal and so arrives slightly later in time, thus producing another image, or ghost, offset slightly from the main image. The ghost is identical to the normal image.

A new structure in the area - for example, a large office block, can cause this problem to occur after years of trouble-free reception.

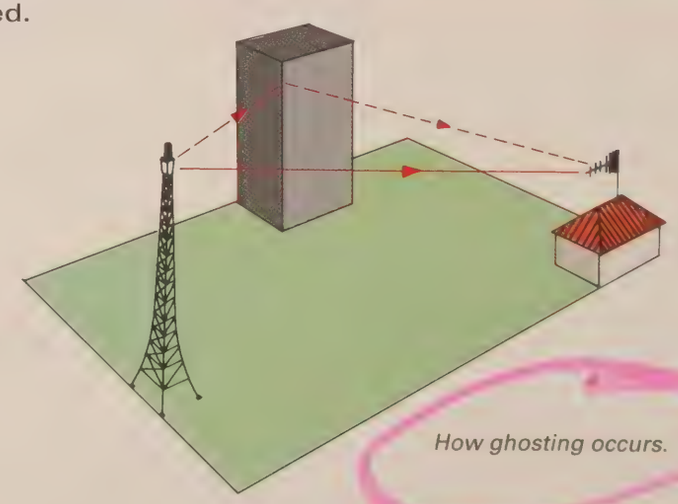
FM radio reception may also be affected by multipath reception. A common symptom of this problem is a harsh edge to the sound, often accompanied by the stereo light flashing. It may also cause a flutter effect on a FM car radio receiver when the vehicle is moving.

WHAT YOU CAN DO

Better picture or sound quality can sometimes be obtained by altering the alignment of the aerial. This will require someone to watch or listen for the best reception whilst the aerial is slowly pointed from side to side, up or down, or twisted.

If that is unsuccessful, it is usually possible to find another position for the aerial resulting in better reception.

Where the problem persists, ask an aerial specialist if there is another type of aerial available which may be more suitable for the area.



How ghosting occurs.

CO-CHANNEL INTERFERENCE

The effect shown here is caused by two pictures being received at the same time from two different television stations operating from different locations, but sharing the same television channel.

You may see two different images overlaid, one on top of the other. Co-channel interference is often accompanied by a venetian blind effect that comes and goes, and frequently by distortion of the sound.

You may also see a black vertical or horizontal bar, or both, drifting slowly through the wanted picture. These are actually the borders of the unwanted picture.

This interference may occur during summer when abnormal conditions can cause television signals to travel unusually long distances.

The lower numbered television channels are more likely to be affected.

WHAT YOU CAN DO

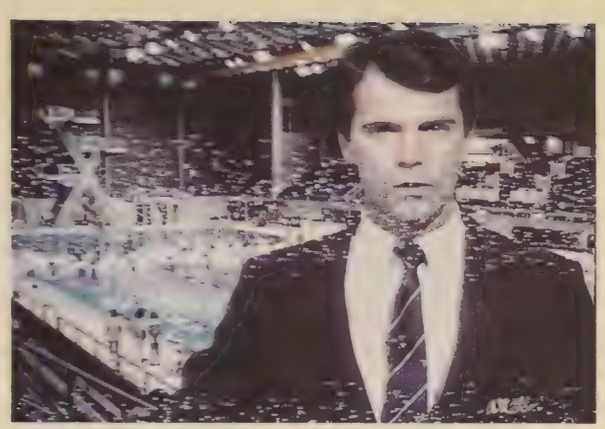
Annoying as it is, this sometimes severe condition is usually infrequent and temporary, ceasing as suddenly as it began. There may be no practical solution.

If this interference is frequent and severe, an aerial specialist can advise you if a different aerial would help.

Examples of co-channel interference (note the two images).

ELECTRICAL INTERFERENCE

POWERLINES TELEVISION



Example of interference caused by high voltage powerlines.

Normal picture.

The interference pattern shown on this picture may be caused by a nearby high voltage powerline.

Two speckled bands drifting slowly up or down the screen are characteristic of this interference. In very severe cases up to six bands may be formed, virtually covering the whole screen, sometimes accompanied by a buzzing sound.

Lower numbered VHF television channels are more frequently, and usually, more severely affected.

Weather conditions are often a factor in this interference. Commonly it begins with the onset of dew or during high winds, particularly after a dry, dusty period. Coastal areas may be affected by salt spray deposits on powerline insulators. The interference may be continuous or come and go during windy weather and may cease after rain.

POWERLINES RADIO

AM reception is more prone to powerline interference than FM reception. The interference is characteristically heard as a buzzing noise.

APPLIANCES TELEVISION

These pictures illustrate some common types of television interference caused by domestic electrical appliances. The offending appliance may be found in your own home or in that of a near neighbour.

The top picture shows the interference that can be caused by some electrical appliances, such as food mixers, drills, sewing machines, razors, vacuum cleaners, and hair driers.

Short lines of white or coloured flecks occurring at random all over the screen, while such an appliance is in use, is typical of this interference. Frequently the whine or buzz of the motor can be heard coming from the television speaker.

The interference occurs only when such an appliance is in use, so noting the times when interference occurs will help you in its identification.

The interference affecting the lower picture is caused by a thermostat or simmerstat, usually installed in an appliance to regulate the temperature.

Thermostats that can cause this type of interference are in many household appliances including electric blankets, waterbed heaters, fish-tank heaters, hot-water systems, refrigerators, room heaters, and electric stoves.

The interference occurs every time the switch contacts of the thermostat or simmerstat open or close. For this reason the interference occurs briefly (a few seconds to several minutes), then recurs after a much longer interval (for example, five to forty minutes).

Typically, the effect is a dense band of black and white or coloured flecks that can appear anywhere on the screen. It may be accompanied by a buzz in the sound from the television speaker.

APPLIANCES RADIO

AM reception is more prone to appliance interference than FM reception. Appliances using electric motors cause a whine or buzz at a pitch which varies with the speed of the machine.

Likewise, thermostat or simmerstat interference is heard as a buzz, caused by sparking as the switch contacts open or close.

Example of interference caused by electrical appliance.

Normal picture.

Example of interference caused by a thermostat.

Example of interference caused by a computer.

OTHER ELECTRICAL PRODUCTS

Virtually any product that uses electricity can cause interference to television and/or radio reception. Most electrical products are designed and manufactured to international interference standards which generally ensures that their use will not disturb reception within the coverage area of a broadcast station.

However, faults may develop in any electrical product which may then cause interference to television and/or radio reception. Possible causes other than appliance or powerline sources include computers, television receivers, fluorescent lights, light dimmers, and street lights.

WHAT YOU CAN DO

Check your receiver and aerial

A faulty aerial, a break in your aerial lead, or the use of an indoor aerial, may cause your receiver to pick up background electrical noise normally swamped by the broadcast signal.

Check for potential sources in your own home

This can be done by turning off all electrical products in the house, one by one (while the interference is occurring), until you find one that stops the interference.

WARNING: Under no circumstances should you try to carry out an internal modification yourself. For safety's sake such work should only be done by a qualified service technician.

Ask your neighbours if they have the same problem

If they have the same problem it is likely that it will be due to interference. However, be sure that they get exactly the same problem at the same time on the same station, or their answer may be misleading. Preferably check the problem yourself on their receiver.

If a neighbour's appliance appears to be causing interference, keep in mind that even if they are also receiving the interference they may be quite unaware of the cause. Be reasonable in any approach you may make. Give them this booklet to read.

If you are unable to identify or locate the source of the interference

If you are confident that your receiver and aerial system is in good order, report the problem to the New Zealand Radio Frequency Service by using the enclosed Questionnaire.

RADIO TRANSMITTER INTERFERENCE

Nearby radio transmitters may cause interference to television and radio receivers for a variety of reasons. Amplifiers and other electronic equipment may also be affected.

Radio transmitters must meet design specifications to limit the likelihood of interference to other services, and operate only on licensed frequencies or channels.

Some low powered transmitting devices such as baby minders, radio controllers for models, and cordless telephones, particularly those brought into New Zealand by overseas travellers, may operate on frequencies that will cause interference to television or radio reception.

TELEVISION

The pictures show effects that may arise from nearby radio transmitters. Different types of transmitters disturb the picture in different ways, and the sound may also be affected.

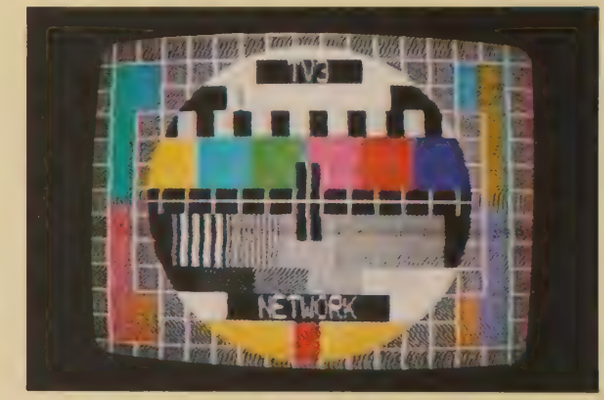
In most cases the cause is not the radio transmitter or its operator. The problem is more likely to occur because the television receiver or VCR is incapable of rejecting unwanted signals from nearby radio transmitters. This deficiency is termed 'lack of radio frequency immunity'.

RADIO

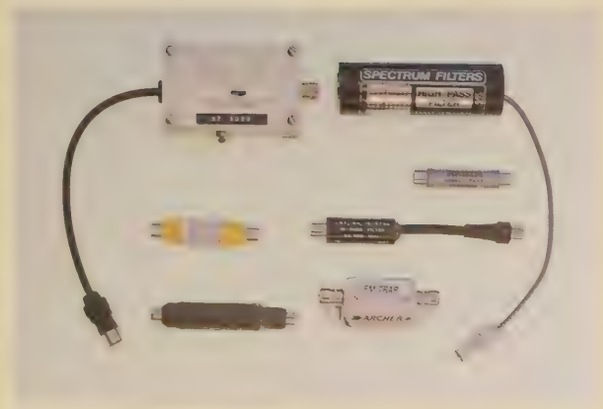
AM and FM radio receivers may also be affected by nearby radio transmitters. Usually the voice or programme from the unwanted transmitter can be heard, although this may be unintelligible.

As is the case with television receivers, this effect is usually due to a lack of radio frequency immunity.

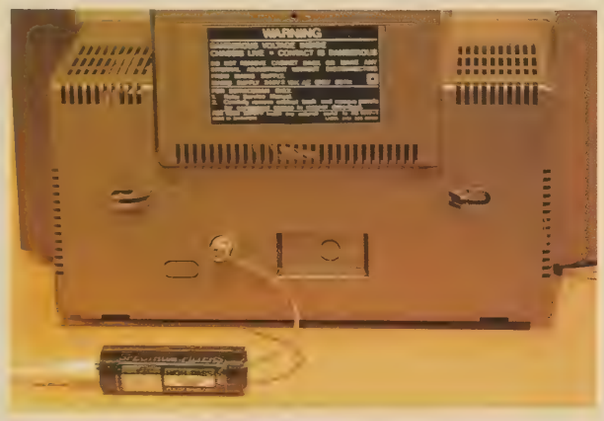
Examples of radio transmitter interference.



Example of interference caused by a cordless phone.



Typical filters.



Filter fitted between television and aerial lead.

AUDIO AMPLIFIERS AND OTHER ELECTRONIC EQUIPMENT

This type of equipment is not designed for the reception of radio frequencies, but may also be affected by nearby radio transmitters. The interference effect is similar to that caused to radio receivers, and is usually known as 'audio rectification'.

WHAT YOU CAN DO

Check your receiver and aerial

A fault in a television or radio receiver including the aerial system, video unit, or other attachments, may contribute to the transmitter interference effect. Consult your equipment handbook to check the controls and the setting of switches, and the connections between the various units.

If you have a masthead amplifier

These amplifiers (or boosters) are easily overloaded and may need to be protected by filters if a radio transmitter is nearby.

Try to identify the unwanted transmitter

You may be able to tell by listening to the speech or programme what service is used by the transmitter, i.e. another television or radio broadcast station, Citizens Band, Amateur, or business two-way radiotelephone service.

Fit a filter to your receiver

Many cases of radio transmitter interference can be cured by fitting a simple plug-in filter between the plug on the end of the aerial lead and the aerial socket on the back of the television, VCR, or FM radio receiver. A service technician should be able to recommend a suitable filter.
If the filter does not work, the television, VCR, or FM radio receiver may require an internal modification to improve its immunity to transmitter interference. A service technician should be able to advise you if this is so.

If the problem is still thought to be due to a faulty radio transmitter

If a recommended filter does not work and a service technician is of the opinion that the problem is interference from a faulty transmitter, report it to the New Zealand Radio Frequency Service by using the enclosed Questionnaire.

If your Audio Amplifier or other Electronic Equipment is affected consult the equipment supplier or a service technician

There are many causes and combination of causes which give rise to audio rectification in amplifiers and other electronic equipment, including telephones, computers, intercoms, burglar alarms, and electronic organs. While some of the solutions are relatively straightforward, many are of a complexity that requires technical assistance.

PRODUCT INFORMATION

Radio, electrical and electronic products can cause radio interference.

- The use of these products worldwide is increasing rapidly. The last decade has seen unprecedented growth and this trend is likely to continue indefinitely.
- The result is increasing levels of radio interference.
- Increasing interference means the reception of radio frequencies for entertainment, business and safety purposes, among others, is adversely affected.

Seemingly harmless interference could be a hazard to life without the public being aware of the risk

- The effects of interference have been recognised worldwide, and limits are set to keep interference to an acceptable level. Those set in Europe are regarded as particularly effective.
- In New Zealand the same limits have been set where possible.

Products which are imported or manufactured may cause hazardous or annoying radio interference, and therefore must be checked for compliance with the legal limits before they are sold or used. These include:

Products which intentionally use radio frequencies.	Products which are unintentional emitters of radio frequency energy.
• VHF and UHF mobile radios. • VHF marine radios. • CB radios. • SSB radios for ship, land and mobile use. • TV and radio broadcast transmitters. • Automatic garage door openers. • Baby minders. • Wireless door chimes. • Radio microphones. • Wireless burglar alarms. • Cordless telephones. • Radio model controls.	• Computers and associated equipment. • Information technology equipment. • Electrical and household appliances. • Portable tools. • Fluorescent lights. • Broadcast sound and TV receivers, VCRs and associated equipment. • Microwave ovens. • Industrial, scientific, and medical radio frequency equipment. • Other electrical products such as: office machines, recording appartus, light dimmers, motor speed controllers, electronic transformers.

APPENDIX

THE CONTROL OF HARMFUL INTERFERENCE

The problems of pollution of the radio-frequency spectrum have long been internationally recognised, with the first New Zealand Radio Interference Regulations specifically controlling the use of 'interfering equipment' being enacted in 1934.

Present day International Radio Regulations issued by the International Telecommunication Union (to which New Zealand is a signatory) requires that Administrations take all practicable and necessary steps to ensure that the operation of electrical apparatus or installations of any kind, including power and telecommunications distribution networks, does not cause harmful interference to a radiocommunication service.

Section 134(g), Part XV, of the Radiocommunications Act 1989, authorises regulations to be made to provide for the prohibition or control of the installation, use, sale, or manufacture of interfering equipment.

The Radio Regulations 1987, Part V, sets out regulations for radio interference, defining "Interfering Equipment" in Regulation 34.

Under these regulations, the Secretary of Commerce is authorised to set limits of intensity for interfering equipment, and to issue certificates of compliance.

The limits within which radio frequency energy produced by interfering equipment must be suppressed, are prescribed by notice in the Gazette from time to time. The current notice is known as Radio Interference Notice 1988. The installation, use, sale, or manufacture of interfering equipment which does not comply with this notice, or the sale or manufacture of interfering equipment without a certificate of compliance, is prohibited.

The present limits contained in the Radio Interference Notice 1988 are the same (where possible) as those set by the International Special Committee on Radio Interference (CISPR) of the International Electrotechnical Committee.

The New Zealand Radio Frequency Service, Communications Division, Ministry of Commerce, is the organisation delegated by the Secretary of Commerce to administer Part V of the Radio Regulations

concerning radio interference. The publication RFS 49 "Procedures for Obtaining Compliance of Interfering Equipment" includes a copy of the Notice, together with an extract from Part V of the Radio Regulations 1987 concerning radio interference.

The radio interference limits are based on the premise that an adequate level of broadcast signal exists within a defined coverage area. The coverage area of a broadcasting transmitter in a given broadcast band, and its minimum usable field strength, are as defined in the International Telecommunication publications "Recommendations of the CCIR" on Broadcasting Services. The CCIR is the International Radio Consultative Committee which provides the technical bases for the efficient utilisation of the radio-frequency spectrum.

In a weak signal area it is not usually feasible to protect a broadcast signal, as even interfering equipment complying with the limits may still cause reception problems.

It is one of the functions of the Broadcasting Commission (New Zealand on Air) to maintain, and where the Commission considers that it is appropriate, extend the coverage of television and sound radio broadcasting to New Zealand communities that would not otherwise receive a commercially viable signal. The Commission does **not** provide funds for the control of harmful interference.

While most electrical and electronic products comply with radio interference limits, there are still cases where through fault, wear, or non-compliance, products generate radio interference which exceeds those limits, and broadcast television and radio reception is adversely affected.

The New Zealand Radio Frequency Service has a trained, experienced, and well equipped field staff to investigate complaints of television and radio interference, and will endeavour to trace the source and ensure compliance with the relevant limits. The costs for this work are borne directly by broadcasters through licence fees payable to the Ministry of Commerce. However, if it is found that the problem is due to a faulty or substandard radio or television receiver (including the aerial system, video unit, or other attachments), a charge will be made.

FIELD OFFICE ADDRESSES

	Delivery Address	Postal Address	Telephone No.	Fax
HEAD OFFICE WELLINGTON	Ministry of Commerce Bldg 33 Bowen St	PO Box 2847 WELLINGTON	0-4-473 2200	0-4-473 2489
WELLINGTON	70 Bloomfield Tce	PO Box 31433 LOWER HUTT	0-4-566 5537	0-4-566 5853
WHANGAREI	105 Lower Cameron Street WHANGAREI	PO Box 449	0-9-438 8491	0-9-438 8663
AUCKLAND	Altos House Cnr Newton Rd & Abbey St Newton AUCKLAND	PO Box 68 217 NEWTON	0-9-378 8537	0-9-378 8344
HAMILTON	512 Grey Street HAMILTON	PO Box 982	0-7-834 2958	0-7-834 2961
ROTORUA	Govt Life Building Haupapa Street ROTORUA	PO Box 847	0-7-346 0370	0-7-346 0372
TAURANGA	Departmental Bldg McLean Street TAURANGA	PO Box 846	0-7-577 9229	0-7-577 6750
GISBORNE	Post Building Grey Street GISBORNE	PO Box 339	0-6-867 8424	0-6-867 8079
NAPIER	First Floor Manchester Unity Building Cnr Kennedy Road & Nuffield Avenue Marewa NAPIER	PO Box 4162 Marewa	0-6-843 5829	0-6-843 5827

	Delivery Address	Postal Address	Telephone No.	Fax
NEW PLYMOUTH	Cnr Liardet & Pendarves Streets NEW PLYMOUTH	PO Box 217	0-6-758 8139	0-6-758 8137
PALMERSTON NORTH	1st Floor 328-330 Broadway Ave PALMERSTON NORTH	PO Box 5063	0-6-356 6710	0-6-356 9110
NELSON	1st Floor 42 Halifax Street NELSON	PO Box 997	0-3-548 2446	0-3-546 9293
GREYMOUTH	Brunner House 54 Tainui Street GREYMOUTH	PO Box 442	0-3-768 0312	0-3-768 0346
CHRISTCHURCH	St Elmo Courts 47 Hereford Street CHRISTCHURCH	PO Box 1800	0-3-365 4401	0-3-365 4156
TIMARU	Room 102 1st Floor Railway Station Station Street TIMARU	PO Box 589	0-3-684 8120	0-3-684 8121
DUNEDIN	12 Hanover Street DUNEDIN	PO Box 5647 MORAY PLACE	0-3-477 1125	0-3-474 0450
INVERCARGILL	Post Office Building 13 Esk Street INVERCARGILL	PO Box 247	0-3-214 4952	0-3-218 4582

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